

**LPRRP Source Control Early Action FFS**  
**Appendices A & D – Conceptual Site Model (CSM) & Empirical Mass Balance**  
**Model (Model) Questions**

**Data Questions**

Why is the Model based only on data from five high-resolution cores? Why was the high-resolution core sample from river mile (RM) 3.5 omitted from the analyses? What are the consequences to the model results due to that omission?

Why was the data set collected by TSI in 1995 not used in the model?

What level of confidence is there that these five samples are representative of the entire 17-mile LPRSA?

Why are only three data points used in the calculation of surficial 2,3,7,8 TCDD concentrations (p 4-17)?

One data point (averaged from a few locations) is used to represent the mass contribution of all of the CSOs, as well as the SWOs. There is no reference for these data, nor is it presented in the Appendix. Is it CARP data? Is it possible to obtain information about these data? How representative are these data of all the sources on the LPR?

What datasets were used to generate each set of summary statistics? This is important because the number of sediment samples from the high-res cores used to develop the summary statistics is not consistent among different COPCs.

Contaminant patterns of all the major LPR tributaries are assumed to be the same and one value is selected to represent mass loadings from the three tributaries. What analyses were performed to determine that one data point would be appropriately representative of the tributary data?

How does the resuspension rate used in the model correlate with core data collected in 1995 and 2005 that suggests that the sediment pack is stable over much of the LPR?

What calculations were performed to determine sediment solids and COPC loadings from the Upper Passaic River based on a sediment sample in Dundee Lake? How representative is this one sample of sediment concentrations in Dundee Lake? It is our understanding that a second sample has been analyzed from Dundee Lake – how do these data compare?

**CSM Related Questions**

As discussed in Section 4.3.1, the ratio of 2,3,7,8 TCDD to Total TCDD is greater for the

surface sample at RM 12.4 then for those located in the Lower LPR with the exception of possibly RM 3.5 sample; this seems to run counter to the Bopp/Chaky observations and Figure 2-5 of Appendix A that the highest 2,3,7,8-TCDD/Total TCDD Ratios are found in the LPR in the vicinity of Harrison Reach.

Section 8 of the CSM provides a list of existing data needs (under the title of uncertainties) to completely characterize the site. Given these data needs/uncertainties, what level of confidence or uncertainty is associated with the EMBM?

On p. 5-3 of the CSM it is stated that “*The relationship between net erosional events, net depositional events, and river flow is not well known currently.*” How is this uncertainty of sediment transport processes reflected in the EMBM formulation, results, and conclusions?

Several statements in the CSM reflect the concept that sediment COPC concentrations in the LPR are homogenous and the EMBM appears to be based on that conceptualization. How does this conceptualization correlate with Figure 1-10 in the CSM which appears to show substantial longitudinal variability in COPC sediment mass/area as depicted in detail by Figure 5-2 of MPI’s Geochemical Analysis Step 2?

### **Model Formulation Questions**

What is the control volume on which the mass balance was performed? It is not clear if the control volume is the water column, recently deposited sediments or both of these together.

Why is an “internal source” term included in the model formulation? What does it represent?

What is the time period over which the mass balance was performed? The model calculates a single mass of contaminant attributable to the sources, with no reference to a time frame.

Without an explicit time frame for the model, how was it determined that the data used is appropriately representative of the system? If the analytical time frame is the overall period of time that sources were active, why is an internal/resuspension source needed? If the time frame is more recent, how is the contaminant mass in the sediments at the beginning of the time frame accounted for?

How was the resuspension flux in Table 7-6 derived?

Two possible scenarios that present different conceptualizations of the solids balance (resuspension provides either 10% or 97% of the solids source in the LPR) are discussed (pg 5-11) and one is selected to establish source mass loadings. What would the model results be if the other scenario were selected? What is the uncertainty in model

associated with this selection?

Since the primary mechanism for the past decline in COPC concentrations in the LPR (as by chemical-specific half lives and exponential decay curves in Figures 7-4a – 7-4q) is the input of sediments with lower COPC concentrations from the Upper Passaic River and tributaries, what is the likelihood that this mechanism will remain unchanged through remediation and many post-remediation decades to come?

The resuspension term and the Model as a whole (Section 5.5, p 5-14) do not account for the resuspension of highly contaminated material during dredging. The COPC/COPEC concentration of this deeper material could be orders of magnitude more than the current surface concentrations that are used in the Model which would lead to higher levels of surface concentration during and after construction – what effect would this have on the cleanup times estimated by the Model?